

Bob Frazee

The Illinois River is part of the third largest river system in the world and drains 18.5 million acres in three states. Most of the watershed is agricultural, but it also includes metropolitan areas, such as Chicago, Joliet, and Peoria, Illinois.

Even though the Illinois River is our state's most important inland water resource, it is being threatened due to major problems associated with sedimentation and stormwater runoff. I developed a fact sheet, "What Happens when it Rains in the Illinois River Watershed?" to provide a hydrologic budget for two scenarios in the Illinois River Watershed - a rural, non-developed area and an urban, developed area with considerable impervious surfaces.

Throughout the Illinois River Watershed, the average annual rainfall is approximately 36 inches. When it rains on the non-developed agricultural land, approximately 27 inches is utilized for evapotranspiration, 7 inches for groundwater recharge, and 2 inches is surface runoff. In contrast, in an urban area with considerable impervious surfaces, only 7 inches is utilized for evapotranspiration, virtually none for groundwater recharge, and 29 inches is surface runoff. (The numbers used in the two water budgets are estimates – they are for educational, not for engineering or hydrological design uses).

Impervious surfaces prevent the rain from soaking into the ground, causing increased runoff and flooding, decreased groundwater recharge, and decreased water availability for plants. Increased volumes and velocities of runoff typically accelerate soil erosion.

Using a 36-inch yardstick, I graphically illustrated the hydrologic budget for the agricultural area on one side and the urban area on the other. I had 2,000 yardsticks imprinted with the Illinois River Hydrologic Budgets, 5,000 Fact Sheets printed and developed an Exhibit Board to convey this information. These educational tools have provided a very unique and effective way to emphasize "Proper land use and management, in both urban and rural areas, is essential to protecting and preserving the Illinois River and its watershed for the future!"

Importance of size on the effectiveness of constructed wetlands for retaining tile-drain runoff and reducing nitrate inputs into agricultural watersheds

Presented by: Maria Lemke, Illinois Chapter of The Nature Conservancy

The Mackinaw River in central Illinois contains some of the highest quality tributaries remaining in the state; however, stream biodiversity is threatened by agricultural practices that dominate land use within the watershed. Rapid transport of subterranean tile-drained waters from agricultural fields contributes to streambank erosion, high nutrient loading, and loss of wetland habitat throughout the watershed. We have estimated that 37-351 metric tons of $\text{NO}_3\text{-N}$ have been transported annually into the Mackinaw River mainstem from just 2 of 32 subwatersheds in the basin during the past 6 years. Our current research is designed to measure how much farmland could be

converted to wetlands to effectively reduce agricultural nutrient inputs to the river. We have worked with landowners to develop a 250-acre demonstration farm with 3 tile-drained wetland units, each consisting of a series of three wetlands that drain 3-9% of the surrounding farmland. Control gates and monitoring equipment set at inlets and outlets of 9 wetlands are used to monitor water quality. Preliminary results show 29-90% retention of $\text{NO}_3\text{-N}$ and 37-100% retention of dissolved phosphorus by wetlands representing 3-9% of the drainage area during spring 2007.